APPEAL BRIEF UNDER 37 C.F.R. § 41.37

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Jiandong Huang et al.	Examiner: Emerson Puente
Serial No.: 09/513,010	Group Art Unit: 2113
Filed: February 25, 2000	Docket: H26156.59389

For: MULTIPLE NETWORK FAULT TOLERANCE VIA REDUNDANT NETWORK CONTROL

APPEAL BRIEF UNDER 37 CFR § 41.37

Mail Stop Appeal Brief- Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The Appeal Brief is presented in support of the Notification on Non-Compliant Appeal Brief mailed July 25, 2008 and May 27, 2008 and the Notice of Appeal to the Board of Patent Appeals and Interferences, filed on March 15, 2007, from the Final Rejection of claims 1-10 and 31-52 of the above-identified application, as set forth in the Final Office Action mailed on December 13, 2006.

The Commissioner of Patents and Trademarks is hereby authorized to charge Deposit Account No. 19-0743 to cover any additional fees in the amount of $500.00 which represents the requisite fee set forth in 37 C.F.R. § 41.20(b)(2). The Appellants respectfully request consideration and reversal of the Examiner's rejections of pending claims.

1. REAL PARTY IN INTEREST

The real party in interest of the above-captioned patent application is the assignee, HONEYWELL INTERNATIONAL, INC..

2. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellant that will have a bearing on the Board's decision in the present appeal.

3. STATUS OF THE CLAIMS

Claims 1-10 and 31-52 are currently pending, and are the subject of this appeal. Claim 1 has been amended in prosecution, while claims 2-10 remain as originally filed. Claims 11-30 were cancelled and claims 31-52 were added in a preliminary amendment filed February 25, 2000. Of these, claims 32 and 43 have been amended during prosecution.

4. STATUS OF AMENDMENTS

No amendments have been made subsequent to the Final Office Action dated November 27, 2006.

5. SUMMARY OF CLAIMED SUBJECT MATTER

Independent Claim 1 recites an embodiment of the invention in which a method of managing the state of a computer network with at least three linked networked nodes, where each of the at least three networked nodes has redundant network connections (*see, e.g.* 101-104 of Fig. 1; p. 5, ln. 22 – p. 6, ln. 19). The method comprises determining the state of a primary network connection between each pair of the at least three networked nodes, determining the state of a redundant network connection between each pair of the at least three networked nodes (*see, e.g.,* Fig. 2; p. 6, ln. 20, p. 8, ln. 11), and selecting either the primary network connection or the redundant network connection, but not both, for sending and receiving data between each pair of networked nodes, such that the network path selected to be used to communicate between each pair is selected independently based on the determined network states for each pair of the at least three networked nodes (*see, e.g.,* p. 8, ln. 1-18), wherein at least one of the at least three networked nodes is operable to selectively forward data, where the data is forwarded to a different one of the at least three networked nodes than the node from which the data is received (*see, e.g,* Fig. 3 at 306-308; p. 8, ln. 12 – p. 10, ln. 3).

Independent Claim 32 recites a network interface, such that the interface is operable to determine the state of a primary network connection between a network interface and the network interfaces of at least two other network nodes, and determine the state of a redundant network connection between the network interface and the network interfaces of at least two other network nodes (*see, e.g.,* Fig. 2; p. 6, ln. 20, p. 8, ln. 11), and select either the primary network connection or the redundant network connection, but not both, for communication with each of the at least two other network nodes, such that the network connection is selected independently based on the determined network states for each other network node (*see, e.g.,* p. 8, ln. 1-18), wherein the network interface is further operable to selectively forward data to a different one of the at least two other networked nodes than the node from which the data is received (*see, e.g,* Fig. 3 at 306-308; p. 8, ln. 12 – p. 10, ln. 3).

Independent Claim 43 recites an embodiment of the invention in which a machine-readable medium comprises instructions that are operable when executed on a computer to

determine the state of a primary network connection between a network interface and the network interfaces of at least two other network nodes, and determine the state of a redundant network connection between the network interface and the network interfaces of at least two other network nodes (*see, e.g.,* Fig. 2; p. 6, ln. 20, p. 8, ln. 11), and select either the primary network connection or the redundant network connection, but not both, for communication with each of the at least two other network nodes, such that the network connection is selected independently based on the determined network states for each other network node (*see, e.g.,* p. 8, ln. 1-18), wherein the network interface is further operable to selectively forward data to a different one of the at least two other networked nodes than the node from which the data is received (*see, e.g,* Fig. 3 at 306-308; p. 8, ln. 12 – p. 10, ln. 3).

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

I. Claims 1-10 and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,153,874 of Kohno in view of U.S. Patent No. 6,192,414 of Horn and U.S. Patent No. 6,434,117 of Momona.

II. Claims 32-52 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kohno in view of Momona.

7. ARGUMENT

A) The Applicable Law under 35 U.S.C. §103(a)

The Examiner has the burden under 35 U.S.C. § 103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). To do that the Examiner must show that some objective teaching in the prior art or some knowledge generally available to one of ordinary skill in the art would lead an individual to combine the relevant teaching of the references. *Id.* The M.P.E.P. adopts this line of reasoning, stating that

> In order for the Examiner to establish a *prima facie* case of obviousness, three base criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *M.P.E.P.* § 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed.Cir. 1991)).

Significantly, the prior art reference (or references when combined) must teach or suggest all the claim limitations (M.P.E.P. § 2142 (citing In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed.Cir. 1991))).

B) Discussion of the rejection of claims 1-10 and 31 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,153,874 of Kohno in view of U.S. Patent No. 6,192,414 of Horn and U.S. Patent No. 6,434,117 of Momona.

Here, the prior art references fail when combined to teach or suggest all the claim limitations. The cited references in combination fail to disclose several claim elements, including selecting either the primary network connection or the redundant network connection, *but not both*, for sending and receiving data between *each pair of networked nodes*, and

independently selecting the path to be used to communicate between each pair based on the determined network states for *each pair of the at least three networked nodes*, as is recited in the pending claims (emphasis added). The pending claims are therefore believed allowable over these references, as explained in greater detail below.

Kohno discusses a system of transmission line repeaters in which the same signal is sent from each node over a pair of redundant transmission lines, such that each repeater is able to detect and indicate a fault in one of the transmission lines. This is described in the specification in the cited col. 3, ln. 20-30, and illustrated by line drivers 2a and 2b having common inputs as shown in Figure 1. Kohno further compares signals received on the two transmission lines, and displays a result of the comparison such as via display control circuit 11. The displayed information is then used by an operator to estimate the location of occurrence of an abnormality in a repeater in one of the two lines (*see,* col. 3, ln. 51-53).

Kohno fails to consider selecting either the primary or secondary network connection, but not both, for sending and receiving data between nodes where the selection is made independently for each pair of nodes. Kohno instead always sends data over both lines (*see, e.g.,* the Abstract, ln. 1-3) and uses the repeaters as shown in Figs. 1, 3, and 5 to monitor for faults. Kohno further fails to select a network path based on the determined state between each network pair, but instead receives a signal over both lines and determines the validity of a received signal at col. 3, ln. 5-7 without any determination of path made anywhere or at any time. Kohno finally fails to consider one of the at least three network nodes operable to selectively forward data, as is recited in the pending claims.

Horn describes a system in which a first computer system is linked to a single second computer system by two or more network links, where the first computer system uses a network stack associated with each network link and a network manager to selectively send application data to the second computer system in a manner transparent to an application running on the sending computer system. Horn also fails to consider selection of one or the other, but not both connections, for sending data in a network environment comprising multiple pairs of interconnected network nodes, such as is recited in the pending claims. More specifically, the pending claims recite limitations where the "network path selected to be used to communicate

between each pair is selected independently based on the determined network states for each pair of the at least three networked nodes", when there are no at least three networked nodes in Horn.

Further, neither Kohno or Horn comprise a network or have networked nodes, as Kohno simply comprises a set of repeaters on a point-to-point transmission line environment, and Horn comprises use of multiple data connections in a point-to-point data communication system. Combination of the repeaters of Kohno with the multiple data connections of Horn, even if some motivation to do so could be found in the references themselves or is believed present under *KSR v. Teleflex* as knowledge available to one of ordinary skill in the art, yields nothing resembling the pending claims, as Kohno teaches away from the present invention by using repeaters instead of making an intelligent decision as to which link to use, and Horn teaches away from Kohno and the present invention by failing to use repeaters or any other device between endpoints in a point-to-point communication system.

Momona simply uses intermediate nodes in a serial communications chain to communicate between nodes not directly linked but linked via the serial chain. Momona is further described as a bus, (*see,* col 4, ln. 2-4), and does not have or suggest selective forwarding of data. Momona fails to consider redundant networking, and fails to consider routing data through an intermediate node in a redundant network to provide communication between two nodes. Momona therefore fails to select a connection at all, much less selecting a connection from an originating node to an intermediate node and again selecting a connection from the intermediate node to a destination node independently on a pairwise basis in a network comprising at least three nodes.

In addition to a lack of explicit motivation for combination of the above references, the function of Momona resembles neither the function and purpose of Kohno or Horn nor the function and purpose of the present invention as taught in the pending claims and in the specification. Neither Kohno nor Horn are concerned with operating in a bus environment, and Momona fails to consider redundant connections. Applicant therefore further objects to combination of these references as lacking motivation for combination in light of the secondary factors mentioned above, and for simply being a piecemeal combination of parts irrespective of function or purpose.

In summary, the above-cited references fail to discuss selecting either the primary network connection or the redundant network connection, *but not both*, for sending and receiving data between each pair of networked nodes, and so the pending claims are not anticipated by any proper or improper combination of the cited references. Further, none of the above-cited references teach network independently selecting the path to be used to communicate between each pair based on the determined network states for *each pair of the at least three networked nodes*, as is recited in the pending claims. Also, no cited reference teaches *selectively* forwarding data in at least one of the at least three networked nodes, where the data is forwarded to a different one of the at least three networked nodes than the node from which the data is received.

Because several elements of the pending claims are not present in the cited references and because motivation to combine the references is improper, the pending claims are believed allowable over the cited art. Reexamination and allowance is therefore respectfully requested.

C) Discussion of the rejection of claims 31-52 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,153,874 of Kohno in view of U.S. Patent No. 6,434,117 of Momona.

As discussed above in greater detail *(see* section ***B***), neither the Kohno reference nor the Momona reference discusses selecting either the primary network connection or the redundant network connection, but not both, for communication with each of the at least two other network nodes, such that the network connection selected is selected independently based on the determined network states for each other network node. Further, Kohno teaches away from Momona and the pending claims in that it uses repeaters to locate a fault and has no intermediate network nodes that have any selective forwarding function, and Momona is a serial bus that has no redundant links between nodes or selective routing functionality. Motivation to combine the references is therefore improper based on a lack of explicit suggestion of motivation in the references themselves and in consideration of secondary factors such as the references teaching away from one another.

Reexamination and allowance of claims 32-52 is therefore also respectfully requested.

8. SUMMARY

For the reasons argued above, claims 1-10 and 31 were not properly rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,153,874 of Kohno in view of U.S. Patent No. 6,192,414 of Horn and U.S. Patent No. 6,434,117 of Momona, and claims 31-52 were not properly rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,153,874 of Kohno in view of U.S. Patent No. 6,434,117 of Momona.

It is respectfully submitted that the art cited does not render the claim anticipated and that the claims are patentable over the cited art. Reversal of the rejection and allowance of the pending claim are respectfully requested.

Respectfully submitted,

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: MS Appeal Brief, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 29th day of July, 2008.

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CLAIMS APPENDIX

1. A method of managing the state of a computer network with at least three linked networked nodes, where each of the at least three networked nodes has redundant network connections, comprising:

determining the state of a primary network connection between each pair of the at least three networked nodes;

determining the state of a redundant network connection between each pair of the at least three networked nodes; and

selecting either the primary network connection or the redundant network connection, but not both, for sending and receiving data between each pair of networked nodes, such that the network path selected to be used to communicate between each pair is selected independently based on the determined network states for each pair of the at least three networked nodes; and

wherein at least one of the at least three networked nodes is operable to selectively forward data, where the data is forwarded to a different one of the at least three networked nodes than the node from which the data is received.

2. The method of claim 1, further comprising building a network status table that indicates results of determining the state of primary and redundant network connections between each pair of networked nodes.

3. The method of claim 2, wherein the network status table comprises data representing network status based on data received at a node from other network nodes.

4. The method of claim 3, wherein the data received at a node from other networked nodes comprises a diagnostic message.

5. The method of claim 4, wherein the data received at a node from other networked nodes comprises data representing the ability of the other nodes to receive data from other different network nodes.

6. The method of claim 2, wherein the network status table comprises data representing network status based on a node' s ability to send data to other nodes.

7. The method of claim 3, wherein the network status table further comprises data representing network status based on a node's ability to send data to other nodes.

8. The method of claim 1, wherein selecting the primary or redundant network connection for communication between each pair of networked nodes comprises:

selecting the primary network connection if the state of the primary network connection is determined to be operable; and

selecting the redundant network connection if the state of the primary network connection is determined to be inoperable.

9. The method of claim 1, wherein selecting the primary or redundant network connection for communication between each pair of networked nodes comprises:

selecting the primary network connection to transmit data if the state of the primary network connection is determined to be operable to transmit data;

selecting the primary network connection to receive data if the state of the primary network connection is determined to be operable to receive data;

selecting the redundant network connection to transmit data if the state of the primary network connection is determined to be inoperable to transmit data; and

selecting the redundant network connection to receive data if the state of the primary network connection is determined to be inoperable to receive data.

10. The method of claim 1, wherein selecting a connection for sending and receiving data between each pair of network nodes comprises selecting a connection for sending and receiving

data from a first node to one or more connected intermediate nodes, and selecting a connection for sending and receiving data from an intermediate node to a second node.

31. The method of claim 1, wherein determining the state of connections between each pair of networked nodes comprises determination of whether each node in a pair of networked nodes can send data to the other node and can receive data from the other node in the pair.

32. A computer network interface, the interface operable to:

determine the state of a primary network connection between the network interface and the network interfaces of at least two other network nodes;

determine the state of a redundant network connection between the network interface and the network interfaces of at least two other network nodes; and

select either the primary network connection or the redundant network connection, but not both, for communication with each of the at least two other network nodes, such that the network connection selected is selected independently based on the determined network states for each other network node;

the network interface further operable to selectively forward received data to a different one of the at least two other network nodes than the node from which the data is received.

33. The computer network interface of claim 32, the interface further comprising a network status table that indicates results of the determination of the state of the primary and redundant network connections between the computer network interface and the network interfaces of other network nodes.

34. The computer network interface of claim 33, wherein the network status table comprises data representing network status based on data received at a node from other network nodes.

35. The computer network interface of claim 34, wherein the data received at a node from other networked nodes comprises a diagnostic message.

36. The computer network interface of claim 35, wherein the data received at a node from other networked nodes further comprises data representing the ability of the other nodes to receive data from other different network nodes.

37. The computer network interface of claim 33, wherein the network status table comprises data representing network status based on a node's ability to send data to other nodes.

38. The computer network interface of claim 34, wherein the network status table further comprises data representing network status based on a node's ability to send data to other nodes.

39. The computer network interface of claim 32, wherein selecting either the primary network connection or the redundant network connection for communication with each of the other network nodes comprises:

selecting the primary network connection if the state of the primary network connection is determined to be operable; and

selecting the redundant network connection if the state of the primary network connection is determined to be inoperable.

40. The computer network interface of claim 32, wherein selecting either the primary network connection or the redundant network connection for communication with each of the other network nodes comprises:

selecting the primary network connection to transmit data if the state of the primary network connection is determined to be operable to transmit data;

selecting the primary network connection to receive data if the state of the primary network connection is determined to be operable to receive data;

selecting the redundant network connection to transmit data if the state of the primary network connection is determined to be inoperable to transmit data; and

selecting the redundant network connection to receive data if the state of the primary network connection is determined to be inoperable to receive data.

41. The computer network interface of claim 32, wherein selecting a connection for sending and receiving data between each pair of network nodes comprises selecting a connection for sending and receiving data from a first node to one or more connected intermediate nodes, and selecting a connection for sending and receiving data from an intermediate node to a second node.

42. The computer network interface of claim 32, wherein determining the state of connections between each pair of networked nodes comprises determination of whether each node in a pair of networked nodes can send data to the other node and can receive data from the other node in the pair.

43. A machine-readable medium with instructions thereon, the instructions when executed on a computer operable to cause the computer to:

determine the state of a primary network connection between the network interface and the network interfaces of at least two other network nodes;

determine the state of a redundant network connection between the network interface and the network interfaces of at least two other network nodes;

select either the primary network connection or the redundant network connection, but not both, for communication with each of the other network nodes, such that the network connection selected is selected independently based on the determined network states for each other network node; and

selectively forward received data to a different one of the at least two other network nodes than the node from which the data is received.

44. The machine-readable medium of claim 43, the instructions further operable to cause a computer to create and maintain a network status table that indicates results of the determination of the state of the primary and redundant network connections between the computer network interface and the network interfaces of other network nodes.

45. The machine-readable medium of claim 44, wherein the created network status table comprises data representing network status based on data received at a node from other network nodes.

46. The machine-readable medium of claim 45, wherein the data received at a node from other networked nodes comprises a diagnostic message.

47. The machine-readable medium of claim 46, wherein the data received at a node from other networked nodes further comprises data representing the ability of the other nodes to receive data from other different network nodes.

48. The machine-readable medium of claim 44, wherein the created network status table comprises data representing network status based on a node's ability to send data to other nodes.

49. The machine-readable medium of claim 45, wherein the network status table further comprises data representing network status based on a node's ability to send data to other nodes.

50. The machine-readable medium of claim 43, wherein selecting either the primary network connection or the redundant network connection for communication with each of the other network nodes comprises:

selecting the primary network connection if the state of the primary network connection is determined to be operable; and

selecting the redundant network connection if the state of the primary network connection is determined to be inoperable.

51. The machine-readable medium of claim 43, wherein selecting either the primary network connection or the redundant network connection for communication with each of the other network nodes comprises:

selecting the primary network connection to transmit data if the state of the primary network connection is determined to be operable to transmit data;

selecting the primary network connection to receive data if the state of the primary network connection is determined to be operable to receive data;

selecting the redundant network connection to transmit data if the state of the primary network connection is determined to be inoperable to transmit data; and

selecting the redundant network connection to receive data if the state of the primary network connection is determined to be inoperable to receive data.

52. The machine-readable medium of claim 43, wherein selecting a connection for sending and receiving data between each pair of network nodes comprises selecting a connection for sending and receiving data from a first node to one or more connected intermediate nodes, and selecting a connection for sending and receiving data from an intermediate node to a second node.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.